

(12) AUSTRALIAN PATENT ABSTRACT

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(54) PLUG

(75) OLLIE ITALIANO OLIVIERI

(21) 84 147/82 (22) 25.5.82

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(51)³ A47K 1/14

(74) TA

(57) Claim

Claim 1.

A convertible, multi-purpose plug integrally moulded from suitable resilient plastic material, and adapted, inter alia, to be used as a removable closure for a drain outlet hole for a sink, tub or the like, said plug comprising a horizontal base portion, a skirt or wall portion upstanding from the base portion, the outer face of the skirt or wall portion being bevelled at an angle of 10 - 20 degrees to the vertical, a co-axial central boss adapted to be gripped manually to raise or lower the plug from or into the spider or strainer fitment of a drain outlet hole, and a resilient circumferential lip around the upper periphery or rim of the said skirt or wall, said lip being angled outwardly from the said skirt or wall at an angle of 40 - 60 degrees from the horizontal.

84147/82

ORIGINAL

FORM 10

Regulation 13(2)

AUSTRALIA

PATENTS ACT 1969

COMPLETE SPECIFICATION FOR THE INVENTION ENTITLED:

"A Convertible, Multi-Purpose Plug."

The following statement is a full description of this invention,
including the best method of performing it known to me:-

The present invention relates to a plug for a sink, drain or other like outlet hole, which plug may also be readily adapted to several other uses.

Hitherto difficulties have often been experienced
5 with presently known plugs because they have been hard to remove from an outlet hole when inserted therein and the sink, tub or the like has been filled with water, especially hot water. Metal plugs have tended to expand and it has been necessary to provide a chain secured to a central boss
10 provided co-axially on the top of the plug. Often such chains break, and a user resorts to placing a sturdy piece of wire through the boss, and even then it is sometimes necessary to use a tool to lever the plug up out of the outlet hole.

An object of the present invention is to provide a
15 cheap and simply mass produced plug which is formed from suitable resilient plastic material as an integral moulding and which seals readily in a drain hole and which is readily removable therefrom without the need for a supplementary chain or the need to apply any leverage other than simple manual pulling
20 to remove the plug from the outlet hole. Another object of the present invention is to provide a cheap and easily manufactured integral moulding, which may be used as an outlet plug or which may be used for a number of other devices as will be described hereafter.

25 Surprisingly the present applicant has discovered that if the outer face of the skirt or wall of the plug is formed at an angle of 10 - 20, preferably 15 degrees to the vertical and if the rim or periphery of the plug is provided with a

resilient circumferential lip angled outwardly at an angle of 40 - 60 degrees, preferably 50 degrees, from the horizontal, then not only is friction between the outer face of the wall of the plug and the inner face of the spider or strainer fitment of an outlet drain hole maximised, when the plug is pushed downwards into the said spider or strainer, but also drag and resistance between the plug and the spider or strainer is minimised when the plug is manually pulled upwards out of the said outlet.

Accordingly, the present invention provides a convertible, multi-purpose plug, integrally moulded from a suitable resilient plastic material and adapted, inter alia, for use as a removable closure for an outlet drain hole for a sink, tub or the like, the said plug comprising a horizontal base portion, a skirt or wall portion upstanding from the base portion, the outer face of the skirt or wall portion being bevelled at an angle of substantially 10 - 20 degrees, preferably 15 degrees, from the vertical, a co-axial central boss adapted to be gripped manually to raise or lower the plug from or into the spider or strainer fitment of a drain outlet hole, and a resilient circumferential lip around the upper periphery or rim of the said skirt or wall, said lip being angled outwardly from the said skirt or wall at an angle of 40-60 degrees, preferably 50 degrees, from the horizontal. Desirably the central co-axial boss is also provided with a circumferential flange extending around the top periphery or rim of the boss to assist a user to obtain a better grip on the boss, thereby obtaining purchase such that the user may readily insert the plug into closing engagement with the wall of the spider or strainer fitment of the outlet hole or alternatively may readily disengage and remove the plug upwardly therefrom.

On the underside of the base portion of the plug of the invention there may be provided a co-axial countersunk hole dimensioned to be engageable over the spider of a drain outlet hole or over the head of a bolt securing a strainer fitment in
5 such a hole.

If the plug is to be used to close a smaller drain outlet hole, then it is not normally necessary to provide a countersunk hole as smaller spiders or plastic strainer fitments do not have a central boss. However, when such a counter-
10 sunk hole is provided, the plug of the invention may be used in several other applications. For example, at least two types of child's toy may be made. Firstly, a spinning top may be made by force fitting into the countersunk hole one end of a spindle which is tapered to a point at the other end.

15 Secondly, a yo-yo may be made by joining together two plugs of the invention by force fitting each end of a cylindrical joining piece into a countersunk hole of one of a pair of oppositely juxtaposed plugs and then securing a suitable length of string around the joining piece.

20 Desirably the spindle for the top and the joining piece for the yo-yo may be made from plastic material.

A filing spike may be made by inserting a piece of dowel or similar joining piece into the countersunk hole of a plug according to the invention, then securing a metal spike in
25 the dowel or joining piece and inverting the plug so that the spike is upstanding from that side of the plug which normally is the underside.

To more fully explain the invention and by way of example,

several embodiments of the invention will now be described with reference to the accompanying drawings wherein:

Fig. 1 is a top perspective view of both embodiments;

Fig. 2 is a corresponding bottom perspective view of the first, or simple plug, embodiment;

Fig. 3 is a vertical cross-section on a diameter of the first embodiment;

Fig. 4 is a similar vertical cross-section but of the second embodiment;

Fig. 5 shows the second embodiment as a plug, the recess fitting over the boss of the "spider" of a plug hole;

Fig. 6 shows two second embodiments juxtaposed to constitute:

Fig. 7 a yo-yo;

Fig. 8 shows how a second embodiment is made to constitute:-

Fig. 9 a toy top;

Fig. 10 shows how a second embodiment is made to constitute:-

Fig. 11 a filing spike.

Referring now to the drawings, the plug shown has a base portion 10, a skirt or wall portion 11, and a co-axial boss 12 with an outer circumferential flange 13.

An outer circumferential lip 14 is provided on the top periphery or rim of the skirt or wall 11.

The provision of this resilient circumferential lip 14 enables the plug of the invention to be removably engaged in

drain outlet hole fitments of slightly varying diameters, with an equally effective water sealing operation, whilst the angling of the outer face 16 of the wall 11 of the plug at substantially 15 degrees to the vertical ensures a close friction fit between the plug and the drain outlet hole fitment, ensuring good water sealing, whilst the resilient lip allows of easy disengagement.

The angle α of the inside wall 15 of the skirt 11 is not critical to the satisfactory operation of the invention, but desirably may be flared or bevelled at an angle of 20 degrees from the vertical.

The angle β between the circumferential lip 14 and the outer face 16 of the skirt or wall 11 is preferably bevelled at 50 degrees from the horizontal to obtain optimal advantage from the plug of the present invention.

The angle θ at which the outer face 16 of the skirt or wall 11 is bevelled is substantially 15 degrees from the vertical. This degree of angling is that which it has been found in practice to give optimum advantage of the plug of the present invention, but a range of bevel angles from 10 - 20 degrees from the vertical is envisaged within the scope of the invention.

Figure 5 and the corresponding sectional drawing Fig. 4 show a plug with a countersunk hole 17 which fits over the spider 18 of a sink strainer fitment 19. The hole 17 is not provided in the plug shown in Fig. 2 and the corresponding diagrammatic section shown in Fig. 3.

Fig. 6 shows two oppositely juxtaposed plugs of the invention with a cylindrical joining piece 20 to be inserted into the countersunk holes 17 of the respective plugs. A resulting yo-yo with string 21 attached is shown in Fig. 7.

5 Figs. 8 and 9 show a spindle 22 which is inserted into the countersunk hole 17 of the plug to form a spinnable top.

Fig.^s 10 and 11 show a spike 23, made from metal or even plastic, which is secured into a piece of dowel or the like, 24, secured in the countersunk hole 17 of the plug, to form a
10 filing spike.

It will be appreciated that the plug of the invention has many uses and can be marketed singly or in multiples in a kit or "do-it-yourself" pack to enable users to make their own toys or filing spikes as the case may be.

15 The plug of the present invention may be formed in several sizes, the diameters thereof varying according to the diameters of the strainer fitments normally provided in standard type sinks, tubs and the like.

The plug of the invention may be manufactured in a
20 range of different colours.

Suitable resilient plastic materials from which the plug of the invention may be formed include, for example low and high density polyethylene in a 50/50 mixture or similar type plastic material.

25 The spindle and cylindrical joining pieces may be made from any type of suitable rigid material.

Other contemplated uses of the plug of the invention when used as a support, include use as a picture frame holder and as a bottletop and display stand.

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

Claim 1.

A convertible, multi-purpose plug integrally moulded from suitable resilient plastic material, and adapted, inter alia, to be used as a removable closure for a drain outlet hole for a sink, tub or the like, said plug comprising a horizontal base portion, a skirt or wall portion upstanding from the base portion, the outer face of the skirt or wall portion being bevelled at an angle of 10 - 20 degrees to the vertical, a co-axial central boss adapted to be gripped manually to raise or lower the plug from or into the spider or strainer fitment of a drain outlet hole, and a resilient circumferential lip around the upper periphery or rim of the said skirt or wall, said lip being angled outwardly from the said skirt or wall at an angle of 40 - 60 degrees from the horizontal.

Claim 2.

A plug as claimed in claim 1 wherein the skirt or wall portion is bevelled at an angle of substantially 15 degrees to the vertical and the lip is angled outwardly from the said skirt or wall at an angle of substantially 50 degrees from the horizontal.

Claim 3.

A plug as described in claim 1 wherein the co-axial boss is provided with a circumferential peripheral flange.

Claim 4.

A plug as claimed in any one of the preceding claims, wherein a co-axial countersunk hole is provided in the underside of the base portion of the plug, the said hole being dimensioned for engagement and disengagement over the axial boss of a spider or strainer fitment in a drain outlet hole.

Claim 5.

A plug as claimed in Claim 3 wherein the outer surface of the co-axial central boss is level with or below the circumferential lip around the rim of the skirt or wall, so that the plug may be inverted to form a support with the countersunk hole on the upper surface thereof.

Claim 6.

A plug as hereinbefore described and as illustrated in any one of Figures 1 to 5 of the accompanying drawings.

Claim 7.

A plug for use as a spinning top, comprising a plug as claimed in Claim 3, wherein one end of a spindle tapered to a point at the other end, is inserted with a force fit into the countersunk hole.

Claim 8.

A plug as claimed in Claim 3 provided with a joining piece one end of which is force fitted into the countersunk hole, and the other end of which is force fitted into the countersunk hole of another plug as claimed in Claim 3, the two plugs being oppositely juxtaposed, and a string being secured to the joining piece.

Claim 9.

A plug according to Claim 3 provided with a support in the countersunk hole and a filing spike mounted in the support.

Claim 10.

A plug as hereinbefore described and as illustrated in any one of Figures 6 and 7 of the accompanying drawings.

Claim 11.

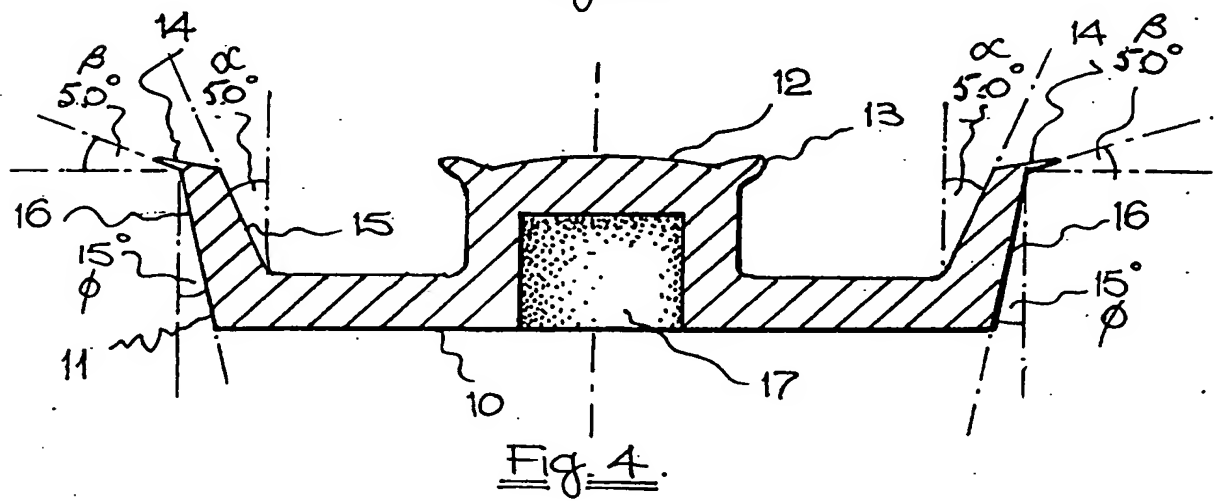
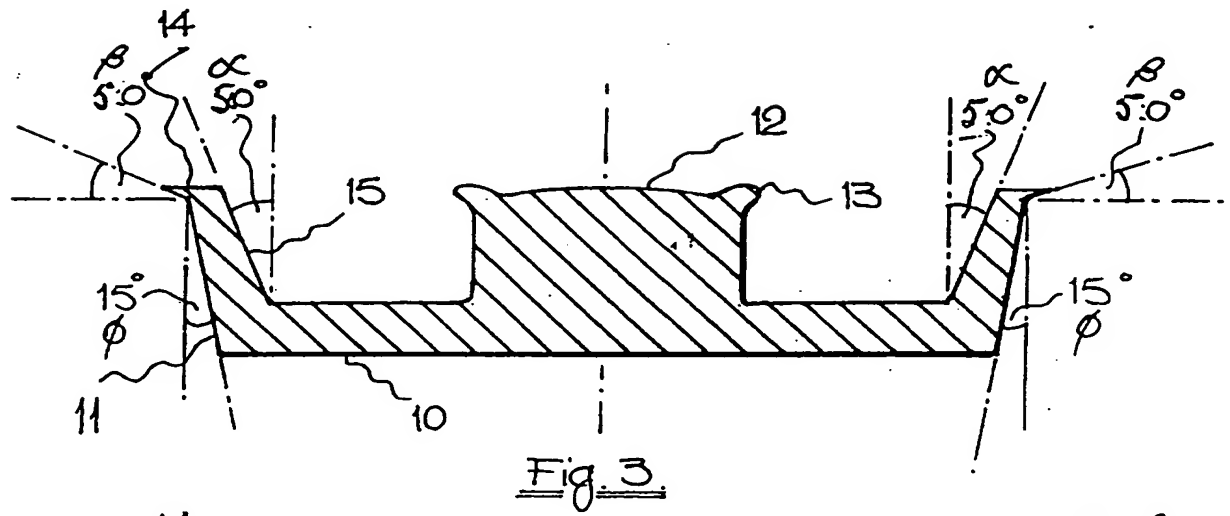
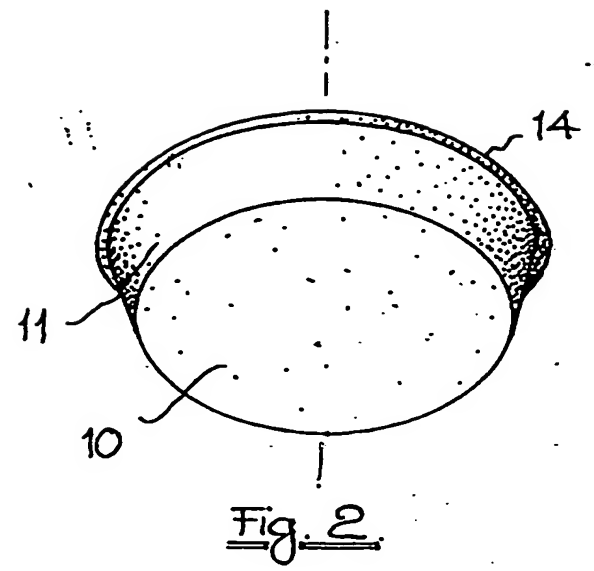
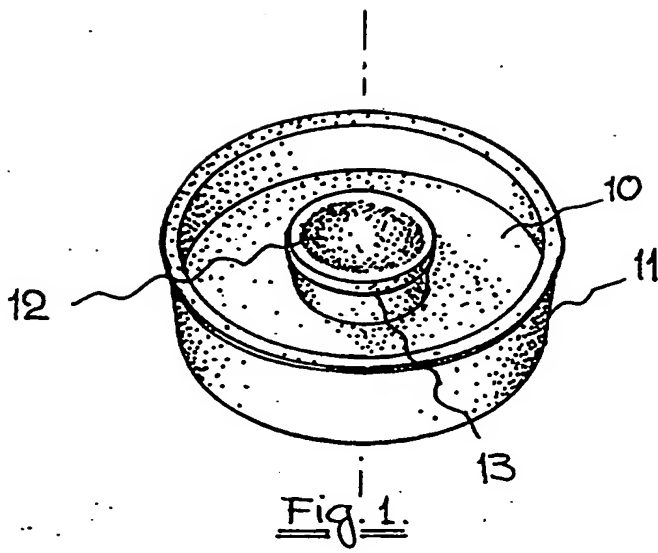
A plug as hereinbefore described and as illustrated in any one of Figs. 8 and 9 of the accompanying drawings.

Claim 12.

A plug as hereinbefore described and as illustrated in any one of Figs. 10 and 11 of the accompanying drawings.

Dated this 25th day of May 1982

OLLIE ITALIANO OLIVIERI



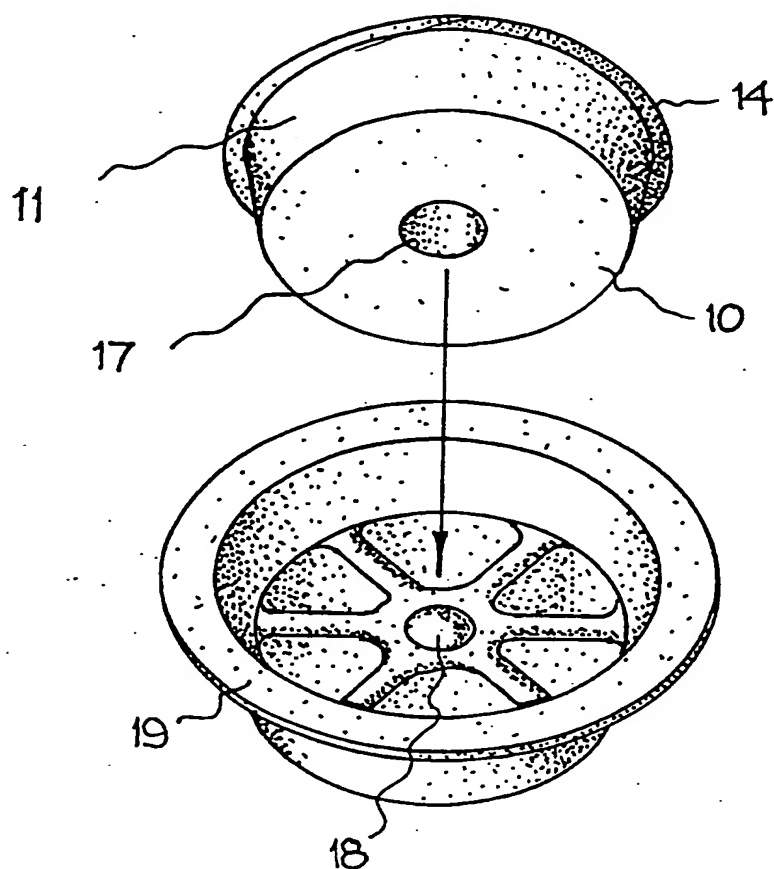


Fig. 5.

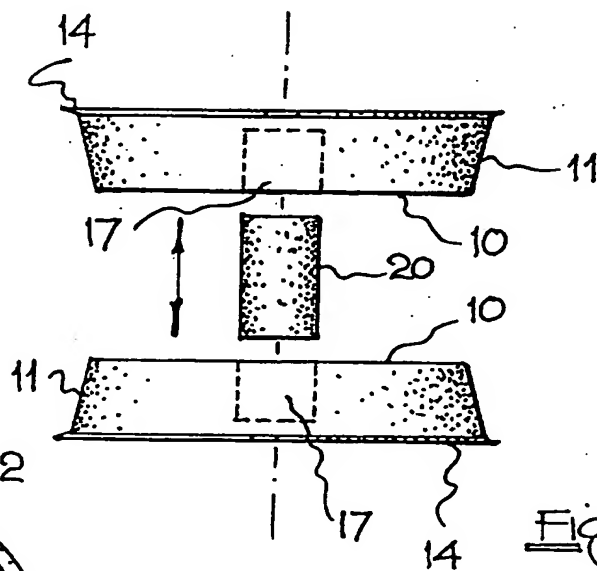


Fig. 6.

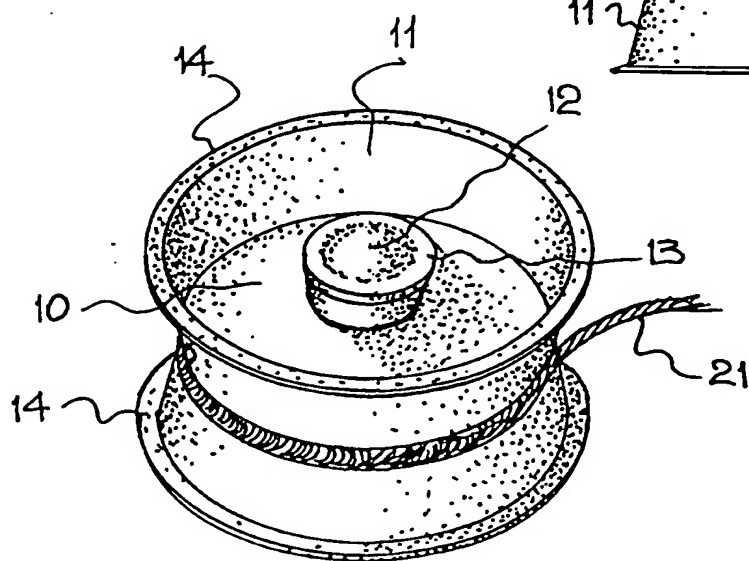


Fig. 7.

